Supporting Information

Regulating the synthesis rate and yield of bio-assembled FeS nanoparticles for efficient cancer therapy

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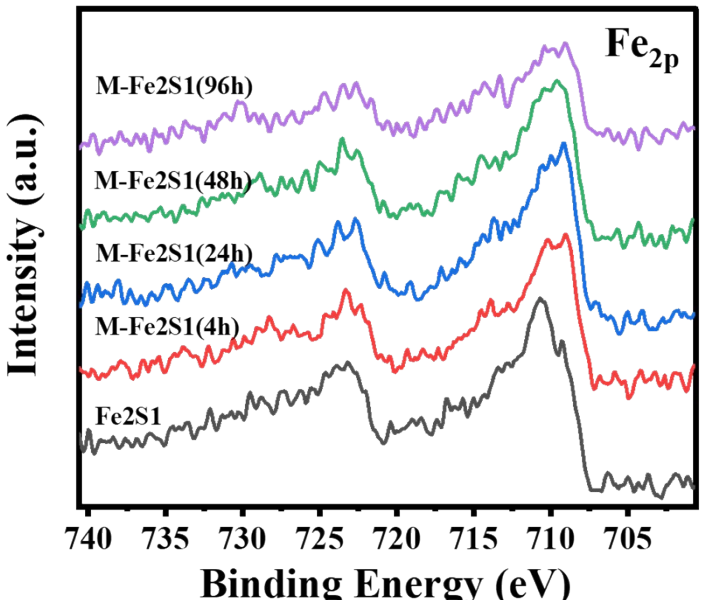

Fig. S1. Time-resolved Fe 2p XPS patterns of the biogenic system. Fe2 refers to 2 mM Fe(III)-citrate. S1 refers to 1 mM thiosulfate. M refers to *S. oneidensis* MR-1.

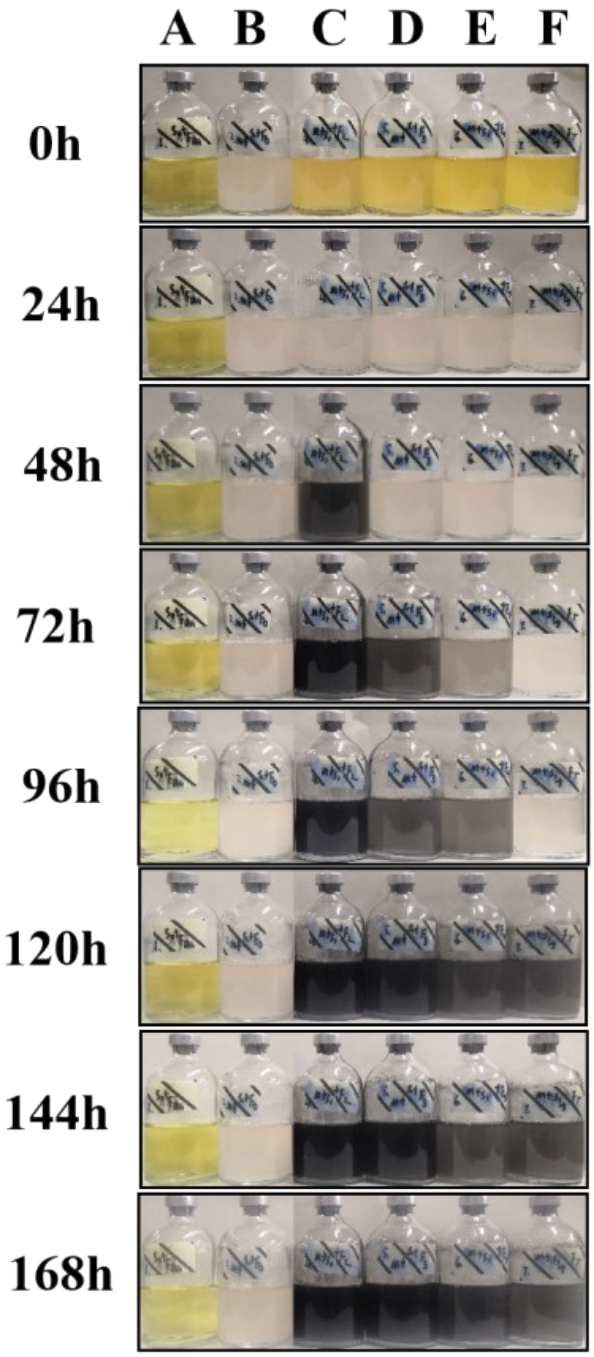

Fig. S2. Images of *S. oneidensis* MR-1cells suspension collected at different incubation times under bright field. Cells were cultivated with 1mM thiosulfate and different Fe(III)-citrate contents. **A** refers to Fe2S1 group, **B** refers to M-S1 group, **C** refers to M-Fe2S1 group, **D** refers to M-Fe3S1 group, **E** refers to M-Fe4S1 group, **F** refers to M-Fe5S1 group.

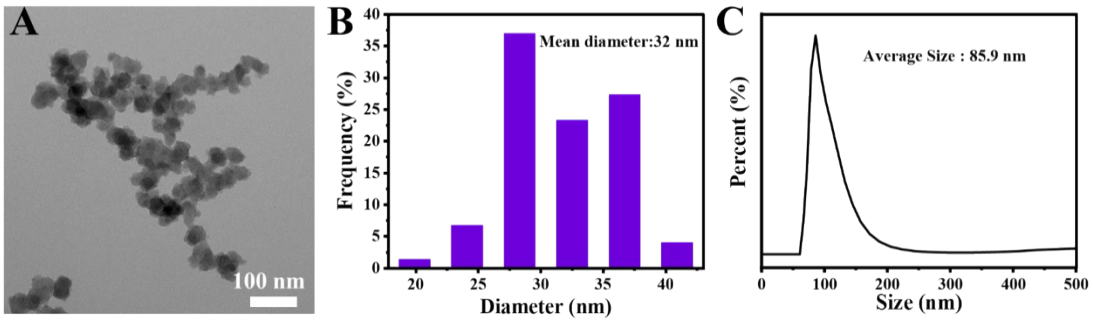

Fig. S3. The characteristics of the purified FeS NPs. (A) The TEM image of Bio-FeS NPs. (B) Size distribution of the Bio-FeS NPs calculated from TEM image.(C) The DLS size distribution of the purified Bio-FeS NPs in water.

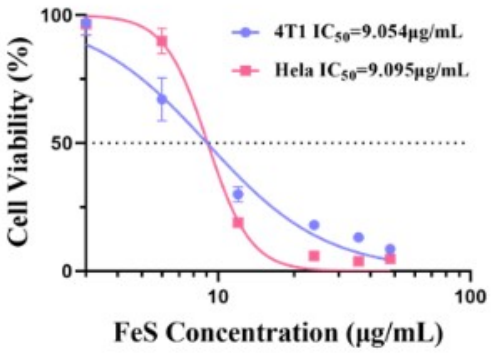

Fig. S4. Half inhibitory concentration (denoted as IC50) of Bio-FeS NPs were calculated using GraphPad Prism software (version 6.01)

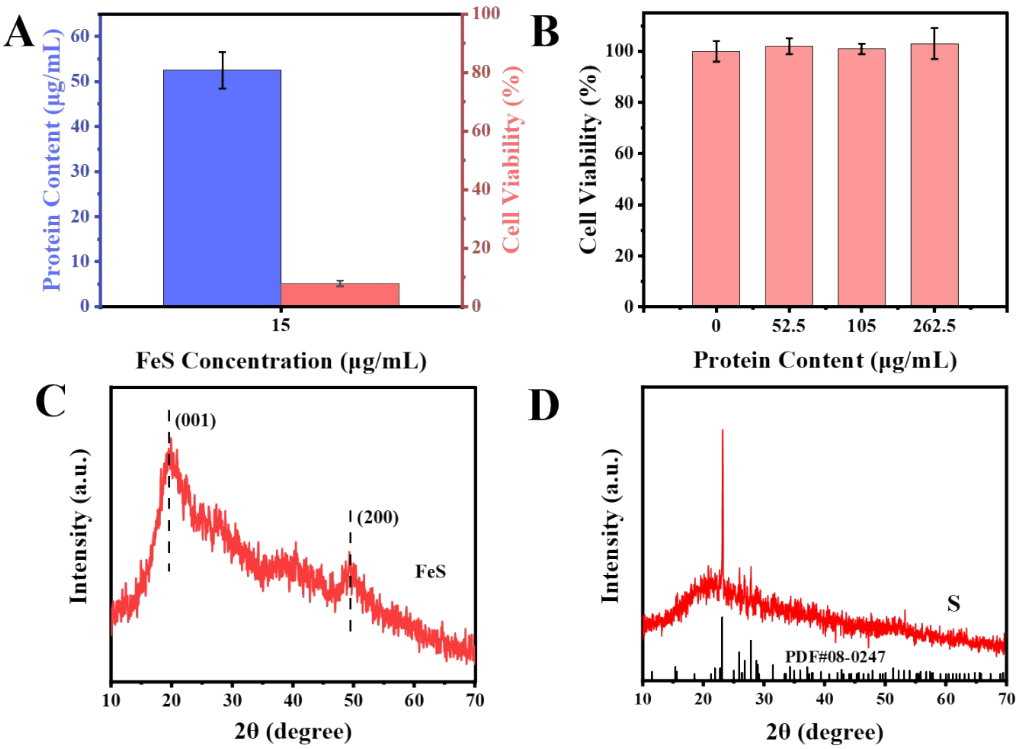

Fig. S5. The functions of proteins capped on FeS NPs. (A) Protein content and cell viability of 15 μg/mL FeS nanoparticles. (B) Cell viabilities of Hela cells after being treated with different concentrations of proteins extracted from bacteria. XRD spectrums of protease K (C) untreated and (D) treated Bio-FeS NPs.

Table S1. Evaluation of the Fenton (Fenton-like) agents therapy efficiency.

Materials	Cell line	Content (μg/mL)	Incubation time(h)	Survivals (~%)	Ref.
One-Dimensional Fe2P (NRs)	Hela	25 50 100 200 300	24	98 95 91 90 85	1
mesoporous copper/manganese silicate nanospheres (mCMSNs)	MCF-7	1 5 10 20 50 100 200	24	95 91 85 56 30 23 21	2
MnO_2-coated mesoporous silica nanoparticles (MS@MnO_2 NPs)	U87MG	1 2 5 10 20	24	91 80 62 52 38	3
Cu/CC NPs	A549	25 50 100 150 200	24	92 79 66 60 51	4
	4T1	25 50 100 150 200	24	75 71 68 56 38	
DSF@PEG/Cu-HMSNs	4T1	0.6 1.25 2.5 5 10 20	24	94 92 80 52 30 12	5
Cu-HCF single-site nanozymes (SSNEs)	Hela	12.5 25 50 100 200	24	100 80 60 48 30	6

Cu-HCF single-site nanozymes (SSNEs)	4T1	12.5 25 50 100 200	24	98 75 65 53 25	[6]
iron-containing metal-organic framework [MOF(Fe)] nanocatalyst	Hela	2 4 8 16 32 64	24	99 95 90 85 78 70	[7]
(FeS@BSA) nanoclusters	Huh7	4 8 12 16 20	24	98 80 32 22 20	[8]
core−shell-structured iron carbide (Fe_5C_2@Fe_3O_4) nanoparticles (NPs)	4T1	50 100 150 200 250 300 350 400	24	98 94 92 91 87 71 63 57	[9]
FeGd-HN@Pt@LF/RGD2	MCF-7	1.75 3.5 7 14 28 56	24	94 99 92 90 81 75	[10]
	U-87	1.75 3.5 7 14 28 56	24	66 50 41 39 28 24	[10]
Bio-FeS NPs	**Hela**	**3** **6** **12** **24** **36** **48**	**24**	**98** **90** **19** **6** **5** **6**	

Bio-FeS NPs	**4T1**	**3** **6** **12** **24** **36** **48**	**24**	**100** **65** **30** **19** **12** **8**	

Table S2 The employed bacteria for FeS NPs biosynthesis

Species	NPs	S-source	Fe-source	Size (nm)	Applications	Ref.
S. oneidensis MR-1	FeS	$Na_2S_2O_3$	$FeCl_3$	30	microbial fuel cells (MFC)	11
S. oneidensis MR-1	FeS	$Na_2S_2O_3$	Fe-citrate	60	microbial electrochemical	12
A. cryptum JF-5&SRB	FeS	SO_4^{2-}	$FeSO_4$	-	remediation	13
Desulfovibrio vulgaris	FeS	$NaSO_4$, $MgSO_4$	$FeSO_4$	several to tens	-	14
S. oneidensis MR-1	FeS	$Na_2S_2O_3$	naphthol green B	30	contaminant degradation	15
S. putrefaciens CN32	FeS	$Na_2S_2O_3$	Fe-citrate	100	contaminant degradation	16
Shewanella PV-4	FeS	$Na_2S_2O_3$	$FeCl_3$	5-10	MFC	17
Geobacter	FeS_2	$(NH_2)_2CS$	$FeCl_3$	26-48	MFC	18
S. oneidensis MR-1	FeS	$Na_2S_2O_3$	Fe-citrate	35	biomedicine	This work

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